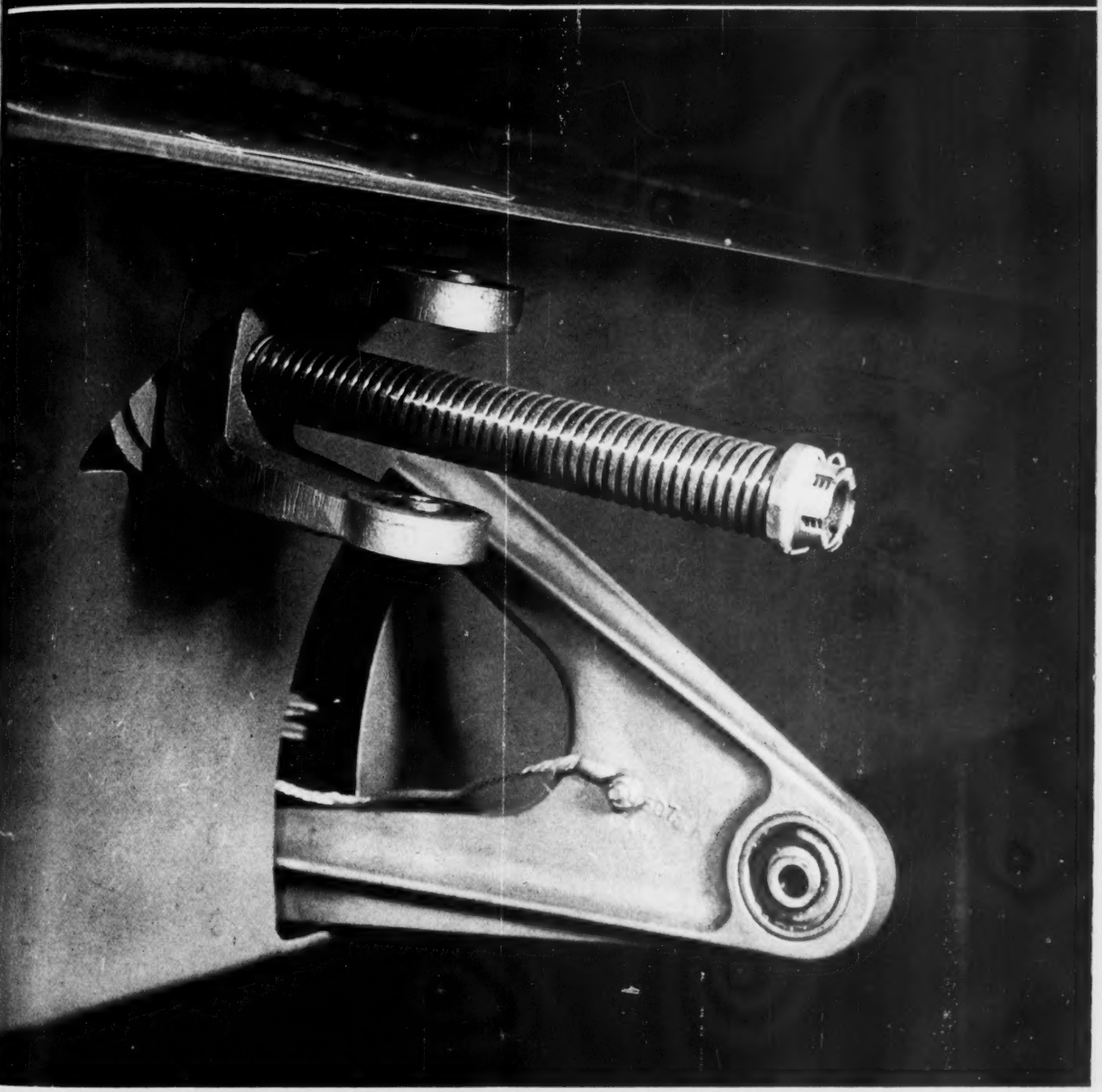
Industrial Standardization



May

War Standard for Acme Threads
(See Article Page 93)

BUY WAR BONDS

1945

American Standards Association

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U.S. Machine Screw Service Bureau

Company Members—

Some 2,000 Industrial concerns hold membership either directly or by group arrangement through their respective trade associations

Readers Write

Standard Sound Level Meters

Good Housekeeping Institute

Dear Miss Mason: In the March issue of INDUSTRIAL STANDARDIZATION I noticed a picture that shows the use of a sound level meter to test the amount of noise made by a water heater. If it is possible for you to furnish me with the name and address of the manufacturers of this sound meter, or any other sound meters that meet the American Standard Z24.3-1944, I would appreciate it.

ARTHUR J. DONNIEZ,
Research Engineer

• • Sound level meters, which will be in accordance with American Standard Sound Level Meters for Measurement of Noise and Other Sounds, Z24.3-1944, are understood to be commercially available from the General Radio Company, the General Electric Company, and the Western Electric Company.

International Cooperation

A. y F. Wiese, S.A., Lima, Peru

Dear Sirs: We have received your magazine, INDUSTRIAL STANDARDIZATION, that is of interest to us and appreciate very much your cooperation. Your magazine will be useful for our next bulletins.

A. y F. WIESE, S.A.

C. T. Brady, Jr., Buenos Aires

Dear Sirs: We have received a letter from Engineer Francisco Mardones, Director of the Instituo Nacional de Investigaciones Tecnologicas y Normalizacion in Chile, stating that they have received INDUSTRIAL STANDARDIZATION from 1936 to 1944 inclusive. They find they are of great interest to the Institute.

O. G. ATTWELL

"Wantable" or "Desirable"

Alexander Smith & Sons Carpet Company

Dear Miss Mason: I like the set up of your abstract ["How Should Laboratory Tests Be Used in Post-War Textile Programs?"] in the February issue of INDUSTRIAL STANDARDIZATION very much, but I was surprised to find that you did not like the word "wantable" or "wantableness." Both Dr. Shewhart and I have hunted for the correct word to describe exactly what it is that makes a person buy an article, or a product, or wish to buy it. The word "desire" is not correct since it has in practice so many other meanings and, after much head scratching, I decided to use "wantable." I found, in reading back on some of Dr. Shewhart's papers on quality value, that he had done the same thing.

A. G. ASHCROFT,
Director of Research

(Continued)

Standard Abbreviations

Philharmonic Radio Corp.

Dear Miss Mason: The clarification of the abbreviations for ohms, thousands of ohms, and megohoms which are used every day in electronic instruction manuals and drawings is long overdue and badly needed. At present both capital and lower case Omega are found in use as the abbreviation for ohms. The prefixes M and K are both used for thousands of ohms while the prefixes Meg and M are both used for megohms.

While there are relatively few instances where the practice of using the lower case Omega would cause confusion with a duplicate use of the letter as a symbol for $2\pi f$, I should think that a definite decision in favor of the capital Omega as a standard abbreviation for ohms should be made by the ASA committee which has jurisdiction over such matters.

I would likewise think that this committee should clarify the prefix confusion by formally adopting the use of K and M as the correct abbreviations for thousands and millions since these are the prefixes normally used in scientific work. Thus thousands of ohms (kilohms) would be abbreviated to KΩ and millions of ohms (megohms) to MΩ.

However, the American Standard Abbreviations for Scientific and Engineering Terms, Z10.1-1941, seems not to recognize the existence of what is considered good practice by showing the use of the capital M as the abbreviation for 1,000 and neatly ducking the abbreviations for megohms, megacycles, etc, by recommending that they be spelled out.

I should appreciate it if you would advise me if there is any work under way at present in reconciling the contradictory material in Z10.1 and in clarifying the troublesome K vs M dispute which appears to be widespread in the electrical and electronic industries.

KARL V. AMATNEEK,
Standards Engineer

Codes on Loan

New York City Tunnel Authority

Gentlemen: I am sorry to have so long delayed returning the War Department and State Safety Codes but we were using them from time to time on an important project.

OLE SINGSTAD,
Chief Engineer

Our Front Cover

Acme screw and trunnion for operating the flap on the Bell "Airacomet," a jet-propelled interceptor fighter, designated by the Army Air Forces as Model P-59. The Acme screw is ¾ in. in diameter and has 8 right-hand double threads per inch.

Industrial STANDARDIZATION Vol. 16 No. 5

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Ruth E. Mason, Editor

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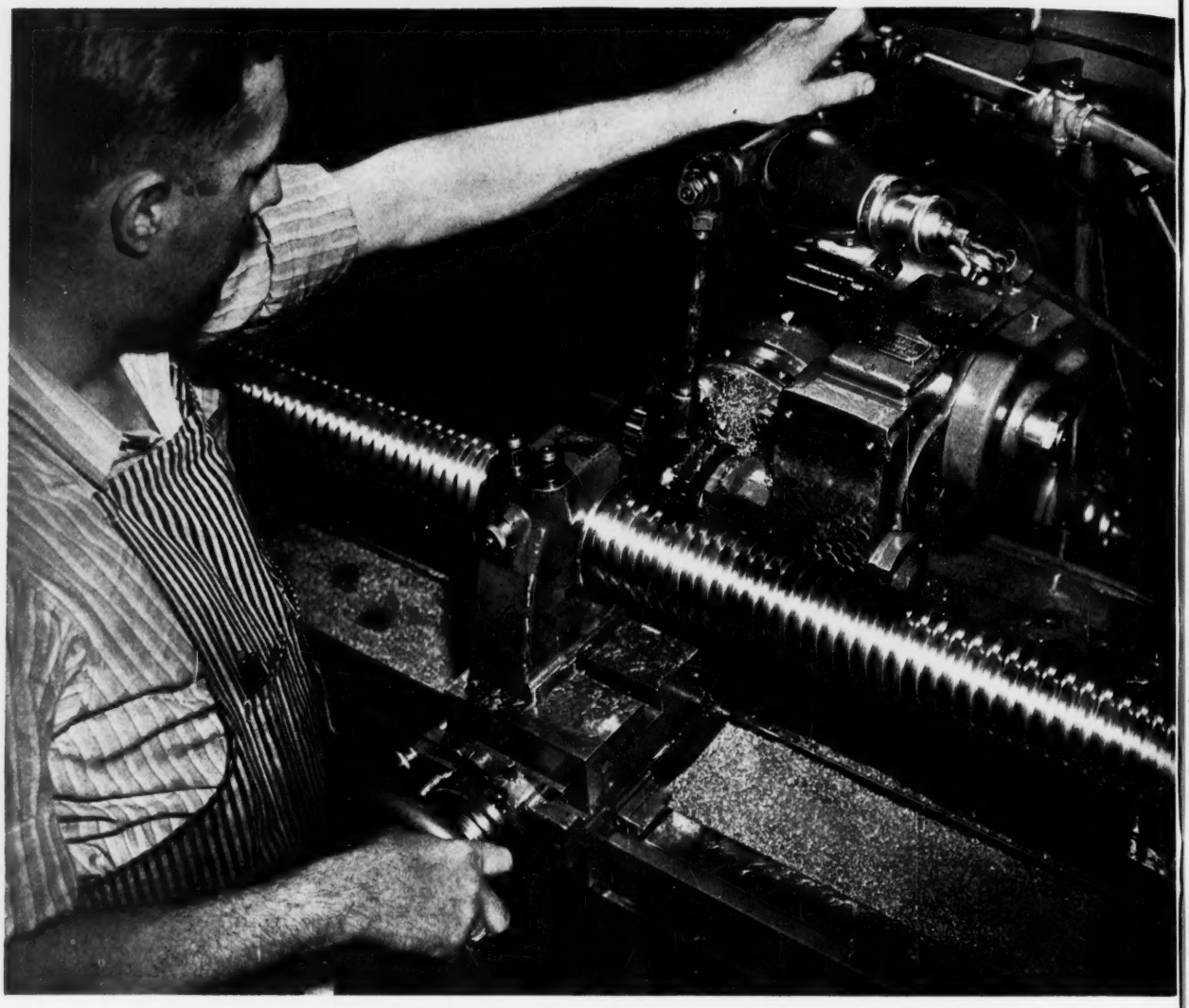
Opinions expressed in articles published in INDUSTRIAL STANDARDIZATION are those of the authors, and not necessarily those of the American Standards Association.

May, 1945 35 cents

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00). Special to schools and libraries $2.00 (foreign $3.00). Re-entered as Second Class Matter July 31, 1943, at the Post Office at New York, N. Y., under the Act of March 3, 1879.



Milling a Double Acme Thread on a Feed Screw For an Automatic Tool Room Machine

This picture shows how a double Acme thread is cut on a feed screw for a Pratt & Whitney Keller, Type BG, Automatic Tool Room machine. The feed screw (184 inches long) will be fixed stationary in a horizontal position in the bed of the Keller machine. The mating gear-type nut of this machine is rotated around the screw to move the column carrying the cutter head longitudinally about 144 inches.

The thread is being cut on a Pratt & Whitney thread miller, using double cutters which mill the full-finished thread in a single pass.

The Acme thread on this screw has a nominal diameter of $3\frac{1}{2}$ inches. The pitch is 0.6 inch and the lead is 1.2 inches. The basic pitch diameter is 3.200 inches and the limits of the major diameter are 3.500 and 3.498 inches. The pitch diameter is held well within the Class 4G limits according to the new American War Standard for Acme Threads, B1.5-1945. The maximum spacing error between leads is 0.001 inch and the maximum lead error is 0.001 inch in 12 inches.

The length of thread on the feed screw is $175\frac{1}{4}$ inches. This makes it necessary to shift the screw in the thread milling machine after 120 inches have been cut. The matching of the thread at this point must be extremely accurate in order to keep lead and spacing within the limits stated above.

The mating nut, which has a thread length of $10\frac{1}{4}$ inches, is chased in a lathe. Its pitch diameter is held between 3.200 and 3.208 inches.

The backlash of the screw and nut assembly is 0.002 to 0.004 inch.

War Standard for Acme Threads Just Published

Covers Acme Screw Threads for Special Purposes, such as Use in Aircraft, as well as for General Purposes

by Paul J. DesJardins[1]

Chairman, ASA War Committee on Acme Threads, B1.5

THE new American War Standard for Acme Threads, B1.5-1945, has now been published by the American Standards Association. Its publication marks the culmination of the efforts of ASA War Committee B1.5 which took up in turn the proposals of the National Aircraft Standards Committee and the National Bureau of Standards and developed therefrom the present all-purpose standard. This standard is expected to fill the needs of a large cross-section of industry and is also forming the basis for corresponding standards being adopted by the Canadian Standards Association and the British Standards Institution.

The events leading to the adoption of the new American War Standard are noteworthy; and their chronological sequence shows the trend toward wider use of the Acme thread form.

How Acme Threads Are Used

When formulated prior to 1895, Acme threads were intended to replace square threads and the various other forms used chiefly for traversing motions. Among the common applications are lead screws and feed screws in machine tools, clamping screws in bench vises, machine vises, and other types of vises, lifting screws in jacks of all types, and operating screws in a great variety of valves.

In covering such a wide field, it was natural that many individual practices would develop among the various groups using and making Acme threads; and finally it became evident that an American Standard to unify these divergent practices was needed.

The Sectional Committee on Standardization and Unification of Screw Threads, ASA B1, organized by the American Standards Association with the American Society of Mechanical Engineers and the Society of Automotive Engineers as joint sponsors, took up the work and published an American Standard, Acme and Other Translating Threads, B1.3, in 1941. This standard clarified the relationship between the basic thread form and the normal clearances and allowances, and established the use of specified pitches for given diameters. It served a useful purpose in this respect but did not adequately cover the wide field in which Acme threads were being applied.

Asked for Special Threads for Aircraft

In December, 1942, the National Aircraft Standards Committee of the Aeronautical Chamber of Commerce requested the ASA to consider the setting up of an American War Standard for special Acme threads for aircraft, having closer tolerances and allowances, and, hence, less backlash than had Acme threads for general purpose covered by the American Standard for Acme and Other Translating Threads, B1.3-1941. The aircraft industry required, also, Acme threads with a centralizing fit between screw and nut.

Work Enlarged to Include Special Uses

Recognizing the vital importance of aircraft production to the war effort, the ASA at once initiated a war project on Acme Screw Threads for Aircraft, and organized a committee to develop the standard. Meanwhile, the War Production Board informed the ASA that certain branches of the U. S. Government had an interest in special types of Acme threads and asked that this be considered in developing the new project. The membership of the ASA War Committee was enlarged accordingly, and the scope of the project was expanded to cover General Purpose, as well as Centralizing, Acme Threads.

Drafts of a proposed American War Standard on Acme Threads were submitted to the committee, first, on behalf of the National Aircraft Standards Committee and, later, by D. R. Miller, National Bureau of Standards. The latter draft, which was submitted also to the Interdepartmental Screw Thread Committee, established by the U. S. Departments of War, Navy, and Commerce, served as the basis for the development of the present American War Standard. The original draft

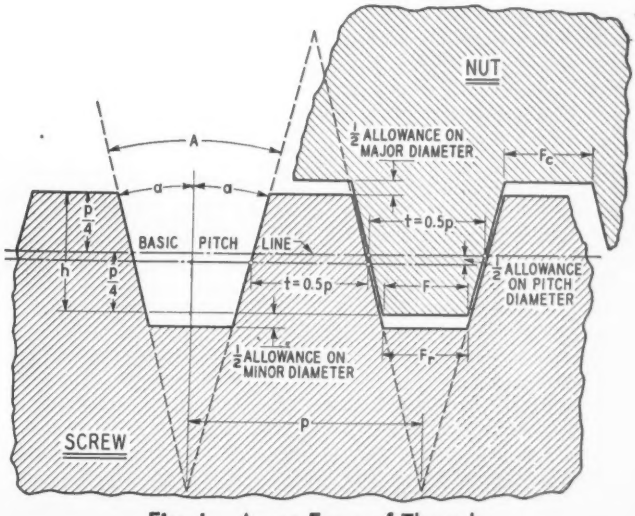


Fig. 1. Acme Form of Thread

[1] Chief Engineer, Small Tools Department, Pratt & Whitney Division, Niles-Bement-Pond Company.

has undergone revisions as a result of discussions between the committee members, comments received through a canvass of key individuals on a draft dated June 30, 1944, and suggestions made by British experts. The subject was discussed with the British when a British Technical Mission (with Stanley J. Harley, Controller of Jigs, Tools and Gauges, British Ministry of Production, as chairman) visited the United States in November and December, 1943, and when a Joint U. S.-Canadian Mission (with Elmer J. Bryant, Greenfield Tap and Die Corporation, chairman of ASA War Committee B1, as chairman) was in London during August and September, 1944.

West Coast Needs Considered

A special effort was made to make the proposed standard acceptable to the Western, as well as Eastern Division of the NASC. Thus, the Centralizing Acme Threads, Classes 5 and 6, with screws having a maximum (basic) major diameter smaller than the nominal diameter, have been added at the request of a group of aircraft companies on the West Coast. The work of this group, headed by C. E. Nickerson, of Lockheed Aircraft Corporation, was of inestimable value and its help in the preliminary work leading up to the final draft was greatly appreciated by all members of the committee.

The final draft, dated November 20, 1944, was unanimously approved by the members of the ASA War Committee on Acme Threads, B1.5, and the General ASA War Committee on Screw Threads, B1. This draft received final ASA approval on January 9, 1945.

The American War Standard on Acme Threads, B1.5-1945, provides for two general applications of Acme threads, namely, General Purpose and Centralizing. The three classes of General Purpose threads have clearances on all diameters for free movement and may be used in assemblies with the nut rigidly fixed and movement of the screw in a direction perpendicular to the axis limited by the screw bearing or bearings. The five classes of Centralizing threads have a limited clearance at the major diameter of the screw and nut so that bearing at major diameter maintains approximate alignment of the thread axis and prevents wedging on the flanks of the thread. For any combination of the five classes of screws and nuts covered in this standard some end play or backlash will be obtained. This is unavoidable for interchangeable product. When backlash or end play is objectionable, one of the three following measures are applied in practice:

(*a*) The nut is split parallel with the axis and adjusted and lapped to fit the screw;
(*b*) The nut is tapped first and the screw is milled, ground, or otherwise machined to fit the nut;
(*c*) The nut is split perpendicular to the axis, and the two parts are adjusted to bear on opposite flanks of the screw thread.

In any case, sufficient end play must be left to provide a close running fit.

In addition to limiting dimensions for the standard series of diameters and pitches of Acme threads, tables of pitch diameter tolerances provide for a wide choice of diameters for a given standard pitch, and by use of the formulas for diameter and pitch increments, the pitch diameter tolerances for special diameters and pitches can be determined for each of the five classes of screws and nuts.

Figure 1 shows the basic form of Acme thread. The American War Standard contains additional figures showing the allowances, tolerances, and crest clearances for General Purpose Acme Threads, and for two types of Centralizing Acme Threads.

In the development of this standard, ASA War Committee B1.5 has closely cooperated with the Interdepartmental Screw Thread Committee of the War, Navy,

Acme Thread Used in the Mechanism for Operating the Bomb Bay Door of a B-17 Lockheed Bomber (Nominal diameter of thread 7/8 in.; pitch 0.125 in.; double lead)

The American War Committee on Acme Threads, B1.5, has the following membership:

Paul J. DesJardins, Pratt & Whitney Division, Niles-Bement-Pond Company, *Chairman*
John Gaillard, American Standards Association, *Secretary*
H. W. Bearce, National Bureau of Standards
Elmer J. Bryant, Greenfield Tap and Die Corporation
Earle Buckingham, Massachusetts Institute of Technology
W. H. Gourlie, W. H. Gourlie Company
D. R. Miller, National Bureau of Standards
C. A. Reimschissel, Landis Machine Company
R. E. Richardson, Army Air Forces
Archibald E. Smith, Army Ordnance Department
W. M. Smith, Bell Aircraft Corporation
K. D. Williams, Navy Department, Bureau of Ships

This committee works under the supervision of the General ASA War Committee on Screw Threads, B1, under the chairmanship of Elmer J. Bryant, Greenfield Tap and Die Corporation.

Copies of the American War Standard for Acme Threads, B1.5-1945, are available from the American Standards Association at 50 cents.

and Commerce Departments. This committee has incorporated the American War Standard on Acme Threads in the new edition of the National Bureau of Standards Handbook H28 (1944), *Screw Thread Standards for Federal Services.*

It is also expected that as a result of the conferences with British and Canadian experts in New York and London, corresponding standards will be published in Great Britain and Canada, thereby establishing a unified American-British-Canadian practice.

Standards Would Benefit Plastics Industry

Glossary of Terms for Plastic Molds Is First Step Toward Standardization

FIRST step toward standardization in the plastic industry is the completion of a glossary of terms relating to plastic molds, completed recently by the technical committee on mold design, L. J. Morrison, Detroit Mold Engineering Company, Detroit, reports recently in the *Journal of Commerce.*

The plastic industry has been slow to standardize, despite the fact that standardization in other industries has brought miraculous results, Mr. Morrison states.

Chief cause of the lag in standardization, in Mr. Morrison's opinion, is the swift development of new materials and processes which has outstripped the development of standards. Contributing cause is the relatively small volume of business handled by the majority of plastic fabricators, which does not provide an incentive to industry-wide standardization.

The majority of plastic fabricators tend to keep production methods secret, Mr. Morrison says. Fortunately, he adds, common knowledge of the principles of processing, now fast becoming universal with the growth of industry, is awakening the plastic industry to the immediate need for standardization.

Primary requisite in the field of plastic standardization, in the opinion of the majority of fabricators, is a common nomenclature for use in correspondence relating to tools and machinery. Second immediate need is the standardization of basic parts of injection presses such as the nozzle radius which should be identical on all presses. Similarly, the holes in the platen for locating the molds should be a minimum standard size.

It is becoming increasingly apparent in the industry that standardization wherever possible will cut the cost of molds and provide interchangeability of parts, thus enabling the industry to compete more advantageously with other industries.

The standardized mold, as described by Mr. Morrison, would be built of SAE 1040 steel plates in the shape of a rectangle. A sufficient variety of sizes and thicknesses would be stocked to cover the majority of molding jobs, thus facilitating quicker and more accurate engineering, a saving of time in the tool and repair rooms and greater salvage of the mold. Due to lower mold cost, short run jobs would become feasible, and a larger volume of production would facilitate the building of greater precision into the mold.

Palestine Organizes New Standards Association

The Standards Institution of Palestine, new national standardizing association, was organized in Palestine in January of this year. The Institution is a joint undertaking of the Government, the Jewish Agency, the Association of Engineers and Architects, the Municipal Corporation of Tel-Aviv, the Manufacturers' Association, and the Industrial Council. The Institution will publish standard specifications of industrial products and materials, will test commodities which have been made the subject of standard specifications, and will issue a standardization mark for tested products. It will also test commodities not standardized so far and will promote research in relation to standardization and concerning properties of materials in general.

The Institution has taken over the Laboratory for Testing Materials in Tel-Aviv in order to carry out its testing program.

Officers of the Institution are:

C. Wilson Brown, CBE, Chairman of the War Supply Board, *President*
Dr. E. Schmorak, head of the Department for Trade and Industry of the Jewish Agency, *Vice-President*
A. Shenkar, president of the Manufacturers' Association, *Vice-President*

Arnold Arnstein, Ch. E., for the past 20 years in charge of the Laboratory for Testing Materials, is Director.

The Institution also plans to publish a journal in connection with the Journal of the Association of Engineers and Architects.

Grade Labeling Blasted

—From *Business Week,* March 24, 1945—

Last week the National Publishers Association of New York, representing 310 principal magazine publishers, came forth with one of the most astute and thoroughly documented of all assaults on A-B-C grade labeling. NPA's study, which is being mailed to congressmen and advertisers, also constituted an expert defense of the descriptive labeling system devised by canners.

Titled *Grade Labeling and the Consumer,* NPA's brochure presents the arguments on behalf of government A-B-C grades for consumer goods in a manner surprisingly unemotional for an organization which has opposed grade labeling more bitterly than the canners themselves have. The study is well-documented with copious quotations from the proponents of grade labeling, particularly from Donald E. Montgomery, formerly Consumers' Counsel in the Department of Agriculture and who now carries the banner for grades as counsel for the United Auto Workers.

But after this thorough review of the record, NPA, which has an obvious interest in protecting brand advertising against the threat of compulsory grade labels, comes to the foregone conclusion that an A-B-C grading system in any field would undermine the economic forces of production and distribution and eventually destroy our democratic, free enterprise system.

New Standards from Other Countries

THE following new and revised standards, received recently by the American Standards Association from other countries, may be borrowed by ASA Members from the ASA Library or purchased through the Sales Department.

Great Britain

New British Standards

Cast Iron Gutters Fittings and Accessories, Part 1, Half Round Gutters BS1205:1945 75¢
Cast Iron Spigot and Socket Rainwater Pipes Fittings and Accessories BS460:1944 $1.25
Cast Iron Spigot and Socket Soil, Waste and Ventilating Pipes Fittings and Accessories BS416:1944 $1.25
Concrete Aggregates and Building Sands from Natural Sources BS882, 1198, 1199, 1200; 1201:1944
Dimensions of Mild Steel and Brass Wood-Screws BS1210:1945 75¢
Drawing Office Organization, Part 9 BS1100:1944 75¢
Galvanized Mild Steel Cisterns, Tanks and Cylinders BS417:1944 75¢
Glass Internal Sills to Wood and Metal Windows BS1209:1945 75¢
Space Required for Domestic Electrical Appliances BS1183:1944 75¢
Synthetic Resin Adhesives for Wood BS1203 and 1204:1945 75¢

Drafts of Proposed British Standards

Brackets of Supports for Lavatory Basins and Sinks CG(HIB) 8634
Cast Concrete Copings CG(CEB) 8965
Cast Concrete Lintels CG(CEB) 8966
Cast Concrete Sills CG(CEB) 8967
Cast Manhole Covers, Gully Gratings and Frames CG(HIB) 8646
Clayware Sills and Copings CG(CLB) 8625
Clay Tiles for Flooring CG(CLB) 8650
Domestic Gas Appliances for Low-Income Group Housing CG(GS) 8655
Drawn Steel Wire Fabric for Concrete Reinforcement CG(IS) 8540
Expanded Metal (Steel) Fabric for Concrete Reinforcement CG(IS) 8539
Expanded Metal (Steel), Revision of BS405
Flush Doors CG(TIB) 8747
Glazed Wall Tiles CG(CLB) 8649
Gypsum Plasterboard CG(CEB) 8872
Methods of Testing Clay Bricks CG(CLB) 8418
O. G. Gutters, Part 2 CG(HIB) 8996
Oil Staines CG(PVC) 8613
Open Fires CG(SF) 9092
Reinforced Concrete Columns for Street Lighting CG(CEB) 9283
Sizes of Natural Stone for Building CG(STB) 9259
Solid Fuel Cookers and Combination Grates CG(SF) 9093
Tumbler Switcher CG(EL) 8621
Washtubs and Tub and Sink Sets CG(HIB) 8636
Wood Battens for Slating and Tiling CG(TIB) 8841

Draft Revisions of British Standards

Asbestos Cement Slates and Sheets CG(ASB) 8672 (Rev of BS690)
Clay Roofing Tiles and Fittings CG(CLB) 8882 (Rev of BS402)
Cast Stone CG(CEB) 8519 (re-draft of BS Specification for Cast Stone)
Concrete Interlocking Roofing Tiles CG(CEB) 8802 (Rev of BS550)
Schedule of Unit Weights of Building Materials CG(B) 8594 (Rev of BS648)
Spot Welding for Light Assemblies in Mild Steel CG(WE) 9536 (Rev of BS1140)
Use of Electronic Valves, Other than Cathode-Ray-Tubes CG(EL) 9153 Rev of BS1106: 1943

NFPA Compiles Codes on Flammable Liquids and Gases

National Fire Codes for Flammable Liquids, Gases, Chemicals and Explosives, Vol. I, 1945 edition, superseding edition of 1943. 592 pp. Cloth. Includes tables and drawings. National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass. $3.00.

NFPA standards dealing with the fire hazards of flammable liquids, gases, chemicals, and explosives and related reference material are assembled in this volume for ready reference. Information on new chemicals and solvents used in war industries, including information on their fire hazard properties and the best method of extinguishing fires, brings this volume up to date. Six new or revised codes are included in this edition.

Codes are in the form of suggested ordinances, standards, or recommended good practice requirements. In some cases the same requirements are present in both ordinances and standards, the ordinance form containing only the mandatory requirements considered suitable for legal enforcement, and the standards containing the same basic requirements with additional explanatory and advisory detail. Irrespective of their form, the codes are purely advisory as far as the National Fire Protection Association is concerned. In preparing the standards, the purpose of the NFPA committees has been to specify measures that will provide reasonable fire safety without prohibitive expense, or undue inconvenience, the NFPA announces.

The history of each standard is given in the introductory note preceding it; also information as to whether it is available in separate pamphlet form.

The volume comprises nine parts: Flammable Liquid Storage and Handling; Oil and Gasoline Burning Equipment; Liquefied Petroleum Gases; Utilization of Flammable Liquids; Gases; Refrigeration and Fumigation; Explosive and Nitrocellulose Materials; Tables of Properties—Hazardous Chemicals, Flammable Liquids; Flash Point Tests.

The NFPA Suggested Ordinance Establishing a Fire Prevention Bureau, included in the Appendix, is intended to give broad discretionary authority to the enforcing officials and enable them to utilize recognized national codes such as those included in this volume as a basis of their rulings and decisions.

Member of ASA War Committee Makes Contribution to Science

Science magazine reports in the March 30, 1945, issue that recording of mating calls and other calls by mosquitoes has been accomplished for the Cornell University Medical College by William Offenhauser, member of subcommittees B, C, and D of American Standards Association War Committee on Photography and Cinematography.

Through reproduction of these insect calls, it is possible to control certain disease-carrying mosquitoes by attracting them to loudspeakers where the sound originates and trap them in various insect-destroying devices placed in front of the loudspeaker.

How the Navy Uses Standards In Its Electronics Program

by Captain J. B. Dow, U.S.N.

How the Joint Army-Navy standardization program now in effect helps to solve current standardization needs; some of the problems connected with this program; and recommendations for a postwar, peacetime standards program.

NAVY electronic equipment is being used in every theater of war, where climatic and other conditions encountered are so severe that the establishment of simulating laboratory tests is an extremely difficult problem. A few of the general, severe conditions are as follows:

High temperature combined with high humidity is encountered in countries such as Malaya, Burma, the East Indies, and the Philippines where the rainfall is constantly heavy on most days during the wet season. The air temperature may rise by day to 40 C and normally falls to about 25 C at night, but is never less than 20 C. Consequently, the relative humidity is very high and frequently reaches saturation for considerable periods.

High temperature and low humidity conditions prevail in many regions and air temperatures as high as 58 C occur during the day and a drop to freezing occurs at night. The relative humidity in these regions may be as low as 5 percent.

Subzero temperatures are encountered in Siberia, Alaska, Northeastern Europe, and the northern parts of Canada. Temperatures as low as —40 C are frequently experienced. Temperatures of —55 C are relatively common and —70 C may occur in isolated regions. Equipment is not generally required by specifications to work below —40 C, but must not suffer any permanent ill effects through transport or storage at the lowest temperature met.

Components may be exposed to an air pressure of 120 mm of mercury at an altitude of 42,000 feet. The rate of change of air pressure may be as high as 10 mm of mercury per second. It should be remembered that equipment not designed for operation when airborne may have to be transported by air freight at high altitudes.

Air temperature at 42,000 feet is reasonably constant at about —55 C. The rate of temperature change experienced by descending aircraft may be as high as 5 C per minute, but the actual rate of temperature change of apparatus will be lower, possibly 2 C to 3 C per minute.

Equipment is likely to suffer prolonged exposure to salt-laden atmosphere and spray from sea water.

Dust may be encountered as a cloud created a few feet above ground level by moving vehicles or as a dust storm created by strong winds which drive the particles to considerable heights and in all directions. The dust particles may be abrasive or hygroscopic.

In an atmosphere near saturation and in other favorable tropical conditions, fungus will start to form within a few days. Many destructive insects are also encountered in jungle regions. The effects of fungi and insects are very serious and call for much additional work on "tropicalization" of components and equipment.

All equipment must withstand, without serious reduction in performance or reliability, severe mechanical vibration, shocks, and rough handling.

Severe Climatic and Service Conditions

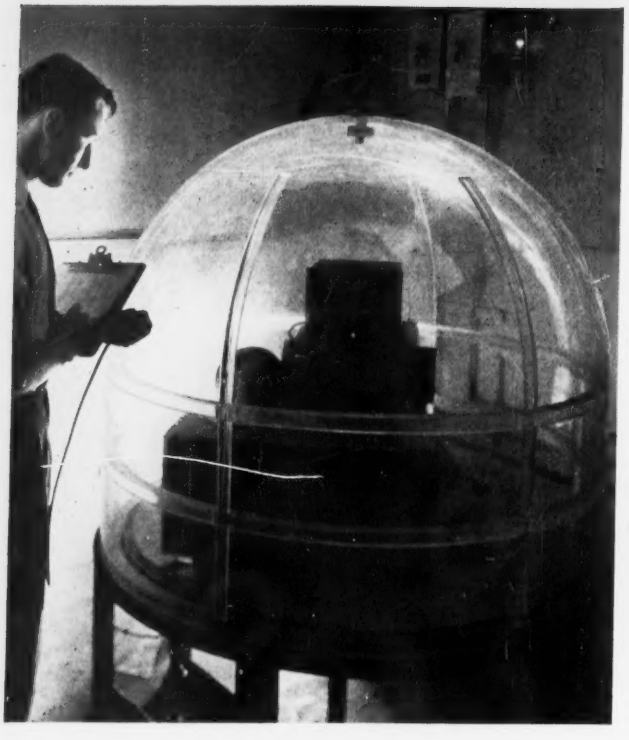
The experience gained in this war has shown that a high percentage of those components designed for domestic commercial service cannot withstand the extremely severe climatic and other conditions to which they are exposed either out-of-doors or under inadequate shelter during shipment, storage, and operation in forward areas. In addition, many refinements and advances in radio, radar, and sonar design during the present war have imposed heavier demands upon the component designers and manufacturers for smaller, lighter, and more dependable types of components the need for which was not entirely realized even a few years ago. In fact, it is believed in many instances that improvements in the designs of components have not been carried out quickly enough to keep pace with equipment advances and, as a result, the problem of improving the usefulness, dependability, and ease of maintenance of equipment in the field is largely contingent upon improving the quality and performance of various necessary components rather than upon further refinements in the basic equipment designs.

Thoroughgoing Qualification Testing Needed

It is felt that improvement of the dependability of components and, hence, of complete equipments, is largely contingent upon more thoroughgoing and extensive qualification testing of components "per se." In many instances, misapplication of components, with attendant high failure within equipment, can be traced directly to the fact that the limitations of the component with respect to electrical ratings, temperature, vibration, pressure, etc, had never been accurately established for the guidance of the equipment design engineer. In this connection, the Navy is establishing at the Naval Research Laboratory a $1,000,000 component-testing laboratory supplied with the necessary measuring apparatus and technical personnel to pursue an active and continuing program for the improvement of components required in radio, radar, and sonar equipments. It is intended that this activity shall be maintained in peacetime on a large scale in order that the types of components suitable for Naval usage can be ascertained and made the subject of continuous improvement. The present qualification testing of components, under Joint Army-Navy standard specifications, is being done on an appreciable scale at this laboratory and will increase as additional types of components are covered by approved JAN specifications.

The actual work of joint standardization of components has been carried on for over two and one-half years by the Bureau of Ships and Signal Corps, in collaboration with the American Standards Associa-

NOTE: This article is abstracted from an address, "The Navy Electronics Program and Some of Its Past, Present, and Future Problems," presented by Captain Dow at the Joint Session of the American Institute of Electrical Engineers and the Institute of Radio Engineers, New York, January 24, 1945.



This bomber nose test chamber takes aircraft and electronic equipment 7½ miles into the stratosphere without leaving the ground.

tion, WPB, and representatives of industry, and has resulted in about 40 published standard specifications with many more to follow in the future.

To better facilitate the work of component-part standardization, the Army-Navy Electronics Standards Agency, now quite generally known by its brief title ANESA, was established in December 1943 and was given the responsibility and authority for coordinating electronic equipment-component specifications to be used by both services. After drafting, the coordinated specifications are processed independently by the Bureau of Ships and Signal Corps through approved channels, and after industry and WPB have offered comments for consideration, a final approved draft is submitted to the Joint Army and Navy Committee on specifications for approval as a JAN specification.

Following issuance of the approved JAN specification, the laboratory facilities of the Signal Corps and of the Navy are pooled to carry out the qualification testing of components and materials submitted by prospective suppliers. Test reports resulting from qualification tests are reviewed by both services regardless of which service laboratory conducted the tests. Following review of the test reports, independent action is taken by each service to establish listings of approved manufacturers of standard components and materials. Action is presently being taken to work out a procedure by which Joint Army-Navy approval certificates can be issued.

Needs of Navy Identified with Standardization

It is felt that the following urgent needs of the Navy flow directly from the need for standardization:

1. Replacement components in Navy yards and depots and in the field are more readily identified and, therefore, more readily usable among various types of Navy electronic equipments, since the standard components can be identified by standard markings, nomenclature, color coding, etc. In this connection, a very major maintenance problem exists in the Navy at the present time because the present nonstandardized systems of marking components do not permit relatively inexperienced personnel to identify usable substitutes or often even identical items supplied by the many equipment manufacturers.

2. The workload imposed on field maintenance personnel, especially those inexperienced in maintaining equipment, is made less burdensome by virtue of the relatively smaller number of non-interchangeable components of each particular type which must be stocked, properly packed, housed, and correlated with the proper Navy electronic equipment.

3. The expanded use of standard components will reduce the vast numbers of components with respect to types, sizes, and ratings which must be dealt with in respect to improvements, testing, inspection, procurement, stock-upkeep, issue, and cataloging, and hence reduce the manhours required for preparing necessary drawings, specifications, stock catalog numbers, and other clerical work.

4. The coordination of production among the various plants of equipment and component manufacturers, and control and scheduling of component deliveries to equipment manufacturers can be accomplished on a far better basis through the availability of standardized and coordinated components. During the past three years one of the most difficult problems has been that of coordinating the production of Navy electronics equipment among the many equipment prime contractors to make maximum use of facilities for the production of components, the availability of which too often has limited and seriously delayed the production of equipment. The magnitude of this problem can be appreciated when I tell you that some thousand different plants and laboratories have been working under Army or Navy contracts in supplying electronic components and equipment. Component standardization will go a long way toward the solution of problems resulting from this cause.

In pointing out some of the shortcomings and difficulties of the component standardization program to date, there is no intention to lessen the appreciation of the work accomplished to date or to overlook the many impeding conditions imposed on such a program by the extremely heavy demands for components resulting from the wartime requirements of the Armed Services. The intent is rather to review the difficulties to date from the viewpoint of suggesting ways and means by which this initial start can be strengthened, expanded, and established on a more effective, firm, and continuing basis as soon as possible.

More Engineers Needed on Standards

One of the more general difficulties has been the disinclination of many engineers both within the Government and within industry to become involved in the tedious, detailed, and relatively uninteresting work associated with the preparation of standards, with the result that a heavy workload has been imposed on a restricted group. It is felt that there should be a greater realization that the responsibility for component standardization must be assumed by a greater number of engineers who have a combined knowledge of the needs of the industry and Armed Services and of standardizing procedures.

Another difficulty experienced in that phase of component standardization having to do with the establishment of performance requirements is the tendency on the part of a relatively small portion of industry to question and heavily discount the necessity for some of the stringent and detailed requirements stipulated by the Armed Services. It is not claimed that the Services are in every case 100 percent correct in asking for certain tight and detailed requirements. However, by virtue of living with and having the responsibility for correcting failures in the field under conditions

in the field, the Armed Services do have knowledge of the need for special performance requirements.

In the past, and even at present, the advantages of standard JAN specifications are being mitigated by requests for waivers from the required tests. Such waivers in whatever form granted, and if allowed to grow, rapidly reduce the value of standard specifications to an ineffectual level. In the last analysis, the effectiveness of any good standard is largely contingent upon all interested activities voluntarily making every effort toward its adoption and application as a desirable instrument to implement mass production and simplify maintenance problems. Requests for waivers should be made only in cases of the highest urgency.

Early Selection of Standard Components Would Help

The production of dependable and easily maintained equipment, with the least component complexity, is largely contingent upon the early selection and application by the equipment design engineer of standard approved items for the various required components during the conception, research, and development phases. Research personnel and development engineers working on the early stages of equipment development are far too prone to use nonstandard components in their early experiments and, far too often, the resulting mechanical and electrical problems left to the final design engineers are so formidable that many nonstandard components are left in the equipment as it is finally delivered, and the great benefits of component standardization are lost.

Another important consideration in overcoming a past weakness in the standardization program is that of selecting three or more geographical locations where adequate accomodations can be established for standardization meetings, in order that participating members can minimize the required traveling, and whatever traveling is necessary will be more equitably shared among the participating members.

While the prime effort of component standardization must be directed toward problems of immediate urgency in advancing the present and future activities of this global war, it is also important that we start plans for a postwar standardization program.

Services Want Postwar Component Standardization

The Armed Services sincerely hope that the component standardization achieved during the war will not be shelved in the postwar period, but will be expanded and improved. A restricted but significant start has been made.

It is not my intent here to attempt to outline the structure for a postwar standardization association, but, rather, to emphasize from the experience gained in this war the importance to the Armed Services and industry, jointly, with the engineering societies, of realizing the need and assuming the responsibility for a cooperative program of component standardization. The reorderings, delays, waste of material, waste of shipping and storage space, excessive purchases of spare parts, added costs, and many other undesirable conditions arising from the use of nonstandardized items must be vastly reduced. Taken collectively, these undesirable conditions have probably already cost the Navy $100,000,000 in this war.

What has been accomplished in standardization under war conditions will be lost again in the years of peace to follow unless industry continues to understand and give full support to solution of the problems of the services. If financial help is needed, I feel that the Navy alone should and would contribute $1,000,000 per year, or whatever amount was needed, to support a virile and effective electronics standardization association, which, in cooperation with the services during the years of peace, would anticipate and remedy the conditions which I have mentioned.

Urge Post-War Progress In Use of Standards

The standardization methods used to speed output for war needs should be carried over into peacetime factories, John H. Hunt, chief of the new devices department of General Motors Corporation, declared in an address before the annual meeting of the Society of Automotive Engineers, January 8.

Mr. Hunt said:

"There probably will be more cooperative effort on automobile standards than in prewar days but the industry will continue to need its own standardizing body. Many of the new materials and processes derived to meet war conditions possess sufficient merit so their use will be continued in preference to return to prior practice. When this occurs, work on new standards can be initiated at once."

The same theme was stressed by Arthur Nutt later in the day when he urged further standardization in the aeronautical industry. Mr. Nutt said that the war had emphasized the importance of the interchange of technical information and ideas through committees and meetings organized for the purpose.

"War has been the driving force to accelerate standardization to assist in giving our armed forces the best equipment in the largest quantities in the shortest time," he said. "Should we forget this progress as soon as the war ends? By all means no. We have a battle of competition to wage on a world-wide scale after this war. We should prepare for this battle now and should continue the fight through the years of peace."

Motion Picture Film Dramatizes Industrial Lighting

A motion picture film dramatizing the American Recommended Practice of Industrial Lighting and demonstrating the basic principles of good lighting under industrial conditions has been released by the Illuminating Engineering Society. The film, entitled "Let Us See," presents in a 20-minute drama specific case histories emphasizing the importance of lighting for greater accuracy and safety, greater ease in seeing, and increased production.

The American Recommended Practice of Industrial Lighting, A11-1942, was prepared under the sponsorship of the IES and approved by the American Standards Association. The standard has also been approved by the Canadian Standards Association.

The film is made for use with standard 16-mm sound motion picture projection equipment, and can be obtained through the Illuminating Engineering Society, 51 Madison Avenue, New York.

Bart Joins ASA Staff As Public Relations Director

Hendry Lars Bart, managing editor of a number of aeronautical and technical magazines, has joined the staff of the American Standards Association as Director of Public Relations to interpret the expanding activities of the ASA in relation to the various industrial and governmental groups associated with it. In announcing the appointment, P. G. Agnew, ASA secretary, stressed the need for a broader understanding on the part of industrial management of the function of standards in our present-day economy. This will be of prime importance in the period of post-war readjustment, particularly in relation to world trade. The ASA is already laying the basis for agreement with the Latin American countries on industrial standards that will affect the buying and selling of many products, and the ASA is also cooperating with the United Nations in work on screw threads and other immediate problems involving the production of war equipment.

Mr. Bart brings to the ASA a broad experience as editor of authoritative magazines and interpreter of technical papers and procedures. He has been an executive editor of *Industrial Aviation, Plastics, Sea Power, Liberty,* and the *Los Angeles Examiner.* Among new magazines that he has launched is the now popular *Skyways.* He has also loaned his services to write technical manuals for military use.

British Rayon Industry Plans Use of Standardization

Standardization, its benefits and economies, will be put to work by the rayon industry after the war to produce inexpensive and durable utility fabrics for the civilian population, A. J. C. Walters, director of the British Rayon Federation, told the American Association of Textile Technologists at its meeting April 4. Many lessons have been learned during the war concerning the economies to be obtained from standardization, Mr. Walters said.

The British rayon industry is now giving careful thought to problems of reconstruction and will advise the British authorities on the measures required to insure that after the war Great Britain will build a rayon industry capable of playing an important part in the country's economy, he said. Particular thought is being given to expansion of the export trade. In the past, however, Mr. Walters declared, the fact that Great Britain had to export up to 80 percent of her cotton and rayon production, and was thus catering to a wide diversity of demand, necessitated a high degree of specialization and prevented the industry in Great Britain from developing automatic machinery to the extent that it had been developed in America.

During the war, the British textile industry has been curtailed in its production to approximately 55 percent of the pre-war volume, but despite this, Mr. Walters finds that the war has stimulated inventiveness and technical progress.

The British Rayon Federation, of which Mr. Walters is director, was formed two years ago under the auspices of the Board of Trade. All sections of the industry—producing, spinning, weaving, finishing, and converting—are associated with it, and consequently, the Federation is in a position to prepare comprehensive and coordinated plans for future development, Mr. Walters explained.

Mr. Walters was in the United States on a visit to textile plants and textile machinery manufacturers. Other members of the party include:

Harold Ashton, General Manager of the Arrow Mill, Courtould's, Ltd, Rochdale, England
A. T. Bennett, technical advisor, British Rayon Federation
A. L. Garrett, director, Fine Cotton Spinners and Doublers Association, Ltd
T. H. Mather, managing director, The India Mill, Ltd
M. Leon, director, Harbens (Viscose Silk Manufacturers), Ltd
H. W. Johnson, William Tatton & Company

NFPA Considers New Dust Explosion Codes

The Committee on Dust Explosion Hazards is recommending to the National Fire Protection Association several new and revised standards in the field of dust explosions which, after approval by the NFPA as sponsor, are to be submitted to the American Standards Association for approval. These include a new Code for the Prevention of Dust Explosions in the Plastics Industry, a revised Code for the Installation of Pulverized Coal Systems to supersede the American Standard Code for the Installation of Pulverized Fuel Systems, Z12.1-1942, and minor revisions in the American Standard Code for Explosion and Fire Protection in Plants Producing or Handling Magnesium Powder or Dust, Z12.15-1944.

This committee since 1922 has been holding regular meetings for the discussion of methods of prevention of dust explosions in various industries, each year recommending new or revised codes as necessary to meet current developments in industry. Separate codes covering 17 different classes of dusts in various industries have been developed to date.

Frequency Broadcast Now on 24-Hour Service

The National Bureau of Standards is servicing a 24-hour standard frequency broadcast on 15 megacycles over station WWV, Washington, D. C., in lieu of the 12-hour service, from 7:00 A.M. to 7:00 P.M., scheduled formerly. Other frequency services are unchanged.

The Bureau's standard frequency broadcast includes standard radio frequencies, standard time intervals accurately synchronized with basic time signals, standard audio frequencies, and standard musical pitch.

ASTM Extends Program to Include Consumer Goods Standards

THE American Society for Testing Materials has taken official action to extend its standardization work into the field of ultimate consumer goods, and has organized a new administrative committee to plan and direct the consumer standards program by extending present committee activities or by establishing new committees. Herbert J. Ball, Profesor of Textile Engineering, Lowell Textile Institute, past-president of the ASTM and chairman of Committee D-13 on Textile Materials, has been named chairman of the new administrative committee.

"The demand for the development and use of standard specifications and methods of test for ultimate consumer goods and the promotion of knowledge of materials for such goods has been growing rapidly in recent years, and has been reflected in the work of the Society in a number of fields, among the more important being textiles, soaps, rubber products, paper, plastics, fuels, paints, and various building materials," the ASTM explains in announcing the program.

Special Committee Recommended Program

Organization of the program and methods of carrying it out were recommended by a special committee under the chairmanship of Arthur W. Carpenter, the B. F. Goodrich Company, vice-president of ASTM. This committee studied the subject of consumer goods standards in its relation to ASTM activities and submitted a comprehensive report which the Executive Committee has adopted as a basis for action. Other members of the committee were:

A. G. Ashcroft, Alexander Smith and Sons Carpet Company
R. D. Bonney, Congoleum-Nairn, Inc
T. A. Boyd, General Motors Corporation
A. L. Brassell, United States Testing Company, Inc
Jules Labarthe, Jr., Mellon Institute of Industrial Research
G. C. MacDonald, Montgomery Ward & Company
H. H. Morgan, Robert W. Hunt Company

The committee's report appraised the extent and significance of the consumer movement, the activities of various agencies in this field, including those of the Government, and the need for consumer goods standards in connection with labeling, grading, and certification plans. It expressed the belief that standardization in this field will become increasingly important and concluded that the American Society for Testing Materials should undertake work on consumer goods standards "within proper limitations."

Engineering Principles to Be Applied

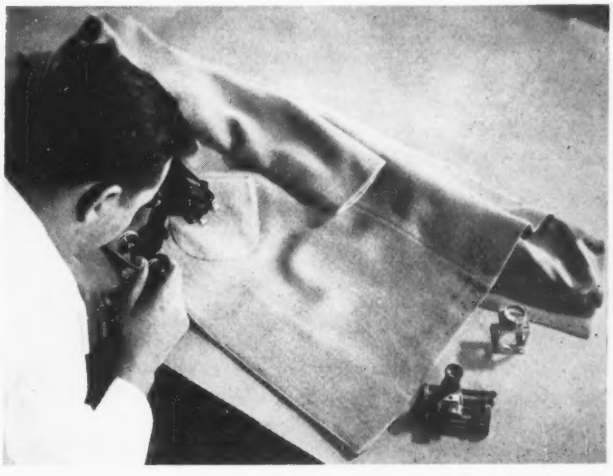
One of these limitations, it is expected, will be to confine the work to consumer goods for which definitions can be specified or for which test data and test limitations can be provided that can be measured by engineering methods. The work must be based on sound engineering principles and practices, it is emphasized. Work on assemblies of materials will be done only where evaluation of materials or workmanship is concerned. It is not intended to undertake the formulation of design specifications. The projects to be undertaken first will necessarily deal with test methods and specifications for specific uses of the consumer goods on which knowledge is already readily available, since definite knowledge and actual test data concerning use characteristics are very limited in most cases of ultimate consumer goods, the ASTM explains.

Standard Manual for Consumer Standards

Among suggestions for work by the standardization committees was a recommendation that a Manual of form, arrangement, and content of ultimate consumer goods standards be prepared for the guidance of committees in the development of such standards. Suggested clauses have been formulated for inclusion in consumer goods standards to define clearly the applicability and possible use limitations of the standard and to disclaim responsibility of the Society for labeling, certification, and advertising based upon the standards.

The Administrative Committee has been authorized to initiate projects and refer them to committees as well as to receive recommendations from the committees for work on consumer goods projects. It will have authority to recommend the organization of new committees in cases where the work cannot be handled by existing committees. The committee has also been directed to give careful consideration to maintaining equivalent standards for the same or similar products that are used both as industrial and ultimate consumer goods. Certain ultimate consumer goods may be excluded by the administrative committee from this ASTM program, however, because of existing Federal regulations, lack of interest in standards, or lack of demand for standards, or because they are not closely connected with the present activities of the Society. Foods, drugs, and cosmetics, for example, may come within this category.

"The successful development of standards in the ulti-



Textile tests are among those now being developed.

mate consumer goods field will require more factual knowledge concerning the wants of consumers and more basic data on use values than are now available," the Society declares. "Accordingly, the Executive Committee, acting upon a recommendation of the special committee, is arranging for the establishment of a project within the Society for the development of techniques for obtaining knowledge of consumer wants and for accumulating data on which to base specifications and methods of test for ultimate consumer goods. This project will be an important aid in the implementation of the entire program and will necessarily utilize social, statistical, psychological, and economic approaches, in addition to those of science and engineering."

British War Experience May Change Factory Designs

WARTIME demand for labor, bringing many women and older people into British factories, thus accelerating the accident rate, has brought about a more intensified study of accident causes, according to the annual report of the Chief Inspector of Factories of Great Britain. The extent of the problem is indicated in the fact that the percentage increase in reportable accidents among adult male workers in Great Britain in 1943 was 49 percent over 1938; but the percentage increase in the case of adult female workers was more than 400 percent. This increase, it is explained, is largely accounted for by the transfer of women to the principal armament and munitions industries from industries with a lower accident risk.

Safeguards Help in Safety Education

In analyzing methods of preventing accidents, the Chief Inspector finds that accident prevention programs that emphasize education in safety have their place, but are of little value unless the management has done everything possible in installing proper safeguards.

The three stages in preventing accidents are described as:

> "1. Find out your facts—where do accidents happen? (To answer this requires proper statistics.) How do they happen? (This means careful investigation.)
> "2. Make sure that processes and equipment are as safe as they possibly can be.
> "3. Educate the worker, and especially the newcomer, in proper methods."

"The value of the third stage depends completely on the adequacy of the first two," the Chief Inspector declares.

Standards of sanitation and factory planning and maintenance may be radically affected by the war experience in Great Britain, the report indicates. Many of the workers have now had experience in the newer factories, and will not readily accept a return to the congested workrooms and poor standards which have been common in many of the older factories, the Chief Inspector believes. As a result, plans are being considered in some quarters for the construction of "communal" factory buildings on bombed sites. The London County Council has already put forward a proposal to construct "flatted" factories—blocks of well-designed rooms of convenient sizes, with good facilities for heating, ventilation, lighting, cleaning, maintenance, that can be let to smaller factory owners who in the past have been driven by economic necessity into old and dilapidated domestic property quite unsuitable for factory purposes. In these communal factory buildings, the Chief Inspector declares, the occupiers can have the advantage of modern layout, power, hoists, and other labor-saving machinery making for economic production. It is expected that this may not only help in solving the transport problem in large industrial towns but may also help in developing modern trades in light engineering, components, and the like.

Standardization Discussed For New Wire Recorders

Manufacturers of equipment for recording and reproducing sound on wire by magnetism are discussing standardization preparatory to entering the postwar market, a recent issue of *Business Week* says.

Standardization is essential in view of the fact that recordings made on one manufacturer's product will be reproduced on another's. It is expected that wire recorders will compete with office dictating machines and home phonographs of the cylinder, disk, and film types and less directly with radio and television.

The wire recorder now manufactured in volume resembles a small, portable typewriter. Two spools, 3¾ in. in diameter and 1¼ in. in height are used. Each spool holds 11,500 feet of 0.004 in. carbon steel wire capable of 66 minutes of dictation or other recording. The wire threads through a magnetic recording head from a full spool to an empty.

According to the developers of the apparatus, wire recording registers tones at sound levels ranging from 15 to 40 decibels and plays back immediately. Errors in office dictation can be removed without affecting the rest of the recording by running the erroneous portion of the wire through a demagnetizing unit. Correct dictation can be reinserted or the wire can be demagnetized entirely and recorded over again an almost indefinite number of times.

The standardization program now under consideration includes speed at which the wire travels through the magnetic head, to insure that all recordings will play back in correct pitch on any machine; size and design of the wire spools or magazines to make them interchangeable among all types of machines; and the diameter of the wire itself.

British Standards Institution Studies Packaging for Far East

The British Standards Institution, in response to a request from the British Government, is studying the problem of packaging in preparation for the Far Eastern war, it was announced recently.

How Statistics Will Help In Postwar Textile Problems

by Leonard Kuvin

Director of Economic Research, Tubize Rayon Corporation

THE future of our industrial economy will depend to an ever increasing extent upon the performance of the industrial technologist. Freedom from depression and the insurance of a continuously advancing standard of living for all of the underlying population will be based on the ingenuity and the creative faculties of this country's technologists.

In the postwar period, profit margins in the textile industry, as in other industries, will accrue to those enterprises which demonstrate the greatest ingenuity and efficiency. Notwithstanding the effect of extensive backlogs of demand for consumer goods of various kinds, the burden of taxation imposed on the future by this war will permit only narrow margins of return on investment. During a period of selective prosperity, only those companies which can demonstrate genuine ability to withstand intense competition will survive.

Prices will certainly be influenced by this competition, but pricing policy will be more genuinely activated by considerations of cost of production than ever before. Leadership in price competition will be taken by those companies which have prepared to reduce costs of production through the introduction of economies.

Sales policies will of necessity be reformulated. Easy-going habits engendered by the war will have to be revised to take into account the fact that the one big customer is no longer in the market. The already changed nature and spirit of advertising will undoubtedly endure, and sales policy will lean more heavily on technological service than on verbal persuasion as to the merits of a commodity.

Research in All Fields to Be Expanded

In this period every important field of research will be intensively cultivated. Technological research of all kinds will be stepped up. Management research will have to be commonplace in every company. Economic and business research is already in the necessity class. Improved public relations on the part of companies and industries has already demonstrated its practical value. Intensive research work on industrial relations is a must. Progressive firms are turning their minds toward research on human relations.

These research activities will be imposed upon industry by the necessities of the day. It will be essential for corporate management to once and for all substitute for rule of thumb and horseback opinion scientific approaches to problems, the application of factual data and evidence.

The textile technologist must broaden his professional interests and quickly adjust himself not alone to current demands made upon him but to newer ones of the future. The rayon technologist must be fully informed of the advances made in cotton and wool technology. By the same token, specialists in the field of cotton and wool must be thoroughly familiar with the technology of rayon. All must pay attention to the newer synthetics that are rapidly knocking on the door of the textile field.

If his primary occupation deals with fabrics he must be thoroughly familiar with the technology of yarns, and vice versa. He must be informed not alone of techniques and procedures relating to materials but must have in his possession for the future a working knowledge of techniques and procedures in non-technological fields. Five principal categories of interest will include the following:

1. *Sales Service and Solution of Complaints.* This is perhaps the oldest field in which the textile technologist has been engaged in the industry. In doing his job better he will have to become more of a technologist than ever before. New developments in the treatment of fabrics that will follow after the war will open large areas of activity for the civilian trades. His tools will be improved. A single example lies in the electronic microscope which will undoubtedly be at his disposal in the near future.

   Sales service and the solution of complaints will be accomplished also by his use of information in non-technological fields.

2. *Product and Process Development.* It will be urgent for management to act on the suggestions raised by the technologist with respect to products and processes which he derives from his knowledge of what is happening in other fields. No longer will it be feasible for companies to ignore his advice and recommendations in the research laboratories on grounds of expediency.

3. *Quality Control in Manufacture.* The textile technologist will be obliged to familiarize himself thoroughly with the newer developments in quality control in the manufacturing process.

   In recent years the application of statistical and management techniques to the control of quality and to the development of superior and uniform products has made rapid strides. While most manufacturing organizations have not yet adopted these methods or have not even heard of them, their rapid spread throughout industry is assured. In companies where

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NOTE: This paper, originally entitled "The Importance of Statistics to the Textile Technologist," was presented before a meeting of the American Association of Textile Technologists February 7, 1945. In it, Mr. Kuvin emphasizes the increasing importance of technology in the textile field. He calls attention to the increasingly widespread use of the statistical method of quality control in many industries, and discusses the way in which the method may be of help in solving some of the postwar problems which he foresees will face the textile industry.

The statistical method of quality control is presented in three American War Standards—Guide for Quality Control, Z1.1-1941; Control Chart Method of Analyzing Data, Z1.2-1941; and Control Chart Method of Controlling Quality During Production, Z1.3-1942. All three of these American War Standards can be obtained from the American Standards Association, the first two in one volume at 75 cents per copy, the third published separately, also at 75 cents per copy.

these procedures are being introduced, the textile technologist is slowly getting acquainted with them.

Quality control is a technique of governing the manufacturing process in such a way as to remove assignable causes of variations in quality and to develop products with relatively uniform characteristics. The reduction in the variation of quality characteristics results in the following effects: (1) improved product, (2) closer tolerances, (3) a better approximation to specifications, (4) reduction of waste, (5) reduction of inspection and total cost of production, (6) the improvement of producer-consumer relationships.

There are numerous instances where consumers of merchandise are thoroughly familiar with the techniques of charting quality observations and who report their observations to producers. The textile technologist will have to become familiar with these techniques so that he can at least speak the language of the informed consumer.

4. *Market Research.* In this field it will be important to the technologist to understand and appreciate the broad trends of consumer demand and of the trends of outlets within his own company. Only in this way will he secure balance and perspective with respect to the distribution of his own time and energy. If he is able to converse with a market analyst in his own terms, he will appreciate the relative importance of outlets of particular types of materials. For example, it is important for a rayon technologist to understand the importance of nylon to the hosiery industry and the outlook for rayon yarn in this field. The technologist's discussion of complaints with the management of his company should be founded on an appreciation of the facts in the case.

5. *Merchandising.* While the textile technologist in many companies at present is familiar with mechandising trends there are many more companies where the acquisition of such knowledge is impeded, or is reserved to a particular department. To this field the technologist can contribute precise knowledge and scientific orientation, and at the same time carry away an appreciation of some of the problems confronting management. He can be of great assistance by being helped in this field in any organization.

Kinds of Statistical Data and Their Uses

In all these activities, management is relying to an increasing extent on external and internal statistical data. While this subject is a field in itself, it is important that the textile technologist acquire a working knowledge of the tools.

Statistical data may be classified into three broad categories: (1) static facts and groupings, (2) relationships in time, (3) dynamic facts.

We are all familiar with general records of past performance. We understand and have dealt with observations of measurements of single items and particular phenomena. We have stared at charts showing time series of these data.

These static facts are the most elementary statistics in the barrel. Their use is limited. Corporate files are cluttered with statistics of this nature. The mental attitude toward them is expressed by the question "So what?"

Some illustrations are the individual observations of the number of defects per square yard in a particular batch of material, or the data on the weight per square yard, or the measurements of the spectroscope on color. So what? The next step is to link these measurements in a time series and reflect on the upward or downward movement.

The answer to questions is often sought in the next type of statistical data; namely, relationships in time. In this field we begin to touch on problems of correlation or covariation.

When one item moves along a particular trend line, it may be possible to associate its movement with the same or an opposite movement of one or more other items. Quite frequently one can anticipate an important movement through the knowledge of previous movements by other items. This is a fortunate circumstance. The ingenuity of the statistician is taxed to discover which items are likely to anticipate the thing in which he is primarily interested. There are dangers in this procedure; of these the technologist must be informed. So, too, must many statisticians be informed of these dangers.

Correlation does not mean causality. Because certain things have moved in a certain way to reveal a particular relationship in the past is no reason to assume that they will do so in the future. Behind covariation may be the influence of another item unknown to the observer, which moves the whole bailiwick one way or another and is alone responsible for the covariation. Here we put our finger on causality.

No matter how involved or refined are the statistical methods and procedures of the statistical craftsman, he must be ever mindful of this danger. Yet, this is an invaluable tool for analysis in the technological and non-technological fields. Without it we would still be talking words and phrases, far removed from the facts of the case. We would not be able to suggest change or refinement in any field of technical inquiry.

Dynamic Statistics

This leads me to the third broad category of data, which, for want of a better term, may be called dynamic statistics. When we talk of change and refinement we imply improvement in measured terms. Dynamic statistics reflect the quantitative achievement of objectives, by the measurement of performance in terms of these objectives. The important thing is to bear in mind that we must use both performance and objectives.

This is no new story. We all know of the terms "quotas" and "percentages." Yet we most frequently fail to apply the concept of setting goals and relating measurements of performance to these goals in a world of physical applications.

Such percentages or relationships, specified for the future, constitute the gist of planning and control. They reflect efficiency or inefficiency.

We can apply this motion to the proportion of the number of instances in which material specifications have been met to the total number of cases. Assume that the number of cases where specifications have recently been met is 80 percent of the total number of cases. Assume we determine that six months from today the proportion should be raised to 85 percent or 90 percent. We are forthwith impelled to find out what caused the 20 percent delinquency. All we want is to reduce this 20 percent to 15 percent or 10 percent in the next six months. The study of the facts in the case behind the specifications is under way and the prospect of achievement is a real one. These are dynamic facts.

University of Iowa Offers Management Course

A three-week course in the principles of management, including time and motion study, plant layout, and production planning, will be offered by the College of Engineering, University of Iowa, June 11 to June 29. The course, now in its seventh year, is designed for plant managers, foremen, and industrial engineers.

ASTM Committee on Petroleum Proposes New Standards

Methods of analysis for petroleum sulfonates and a test for potential gum in aviation gasoline are being sent to letter ballot for approval as Tentative Standards; changes in other standards are proposed

MEMBERS of the American Society for Testing Materials Committee D-2 on Petroleum Products and Lubricants, meeting in Detroit, January 13-16, discussed standards and research, held group sessions on neutralization and lubricating greases, and received reports from its subcommittees.

Accepting the resignation of Dr. R. P. Anderson, secretary, the committee by rising vote expressed its appreciation of his 17 years of service and elected him an Honorary Member. David V. Stroop, secretary of the Division of Refining, American Petroleum Institute, was appointed acting secretary of the committee.

In a review of technical activities, the development of thermometers for low-temperature use in connection with the work on measuring viscosity was reported. Precautions which should be taken at low temperatures will be included in the Methods of Test for Kinematic Viscosity (D 445), the committee plans.

Other recommendations included deletion of the requirement for a specified nameplate on the Union Colorimeter (D 155) in view of the fact that the patent had expired. Evaluation of a photo-electric relative color density method to replace the usual visual method is under way.

In a preliminary report, the Subcommittee on Sulfur Determination said that cooperative tests had been carried out on certain aromatic hydrocarbon mixtures which included motor benzol and cumene and that results showed the possibility of close reproducibility. The methods used are covered in the ASTM Methods of Test for Sulfur in Oils, D 90.

Tests on Flash Point

Tests carried out on three oils to determine reasonable reproducibility limits in Method for Flash Point (D 92) have resulted in the recommendation that, with the same operator and facilities, results should not differ by more than 5 F. Studies on procedures for detecting explosive vapors in fuel oil will be continued.

In work on cloud and pour testing, present plans include publication in the committee's annual report of a method for estimating maximum pour points of lubricating oils containing pour point depressants. In this work seven procedures with 19 selected oils were evaluated during the past two years. Publication of the resultant data was recommended in order to gather additional facts on the results of field tests. Cooperative work will be continued.

Methods of analysis for petroleum sulfonates, reported for information in 1944, are being recommended for approval as tentative standards.

Other reports indicated activity in the analysis of petroleum products according to hydrocarbon types. Included in the list of methods developed are: Test for Olefins, Aromatics, Paraffins, and Naphthenes in Aviation Gasoline without Distillation into Fractions (ES-45); and Test for Benzene, Toluene, and High-Boiling Aromatics in Aviation Gasoline (ES-46). Other related problems under consideration include determination of olefinic unsaturation by chemical methods; analysis of hydrocarbons by adsorption; refractive index, dispersion and density; and determination of purity of hydrocarbons by freezing point.

Potential Gum Test Now Standard

A test for potential gum in aviation gasoline, published as information previously, will be submitted for ballot as a tentative standard.

Technical Committee B on Lubricating Oils will be reorganized into three types of sections, it was reported. The first will study the relation between test data and service performance of lubricants; the second will study and develop information on specific properties of lubricants; and the third will cover problems of standardization, editorial questions, and nomenclature.

Active work on turbine oils currently includes studies of rusting and oxidation and emulsion tests.

Technical Committee G on Lubricating Grease, newly organized, will function in three sections: I, Chemical and General Laboratory Tests for Lubricating Greases; II, Consistency Measurements and Related Physical Tests of Lubricating Greases; and III, Functional Tests for Lubricating Greases Employing Antifriction Bearings.

Changes in these standards, in so far as their effect on American Standards for Petroleum Products is concerned, will be reported later by the ASA Sectional Committee on Petroleum Products and Lubricants, Z11.

Urges Standard Dates

It is high time America and Britain stopped mixing dates and standardized their usage, Major Randolph Churchill, Conservative, told his father, Prime Minister Churchill, recently in the House of Commons.

In a formal complaint to the Prime Minister, Major Churchill stated, for example, that "1/10/45" on letters and documents meant "October 1, 1945," to an Englishman and "January 10, 1945" to an American.

The Prime Minister agreed that uniformity of notation and nomenclature was of high value between allies in war, adding that progress had been made in many directions. He promised to inquire into the matter.

The British method has been adopted by the Armed Forces of the United States to avoid the possibility of confusion.

New Standards in ASA Library

(For new American Standards see pages 109 and 111.)

For the information of ASA Members, the American Standards Association gives here a selected list of standards received by the ASA Library last month. The list below includes only those standards which the ASA believes are of greatest interest to Members.

These standards may be consulted by Members at the ASA Library, or copies may be obtained from the organization issuing the standard. The address of the organization is included for your convenience in ordering.

Associations and Technical Societies

American Society for Testing Materials (260 South Broad Street, Philadelphia 2, Pa.)

As a service to Company Members, the ASA maintains a sale file of all ASTM standards. They can be purchased from the ASA Sales Department at 25 cents each except where otherwise noted.

Tentative Method of Test for:

Deformation of Plastics Under Load D621-44T
Haze of Transparent Plastics by Photoelectric Cell D672-44T
Luminous Reflectance and Transmission Characteristics and Color of Plastic Materials D791-44T
Measuring Relative Mobility of Thermosetting Molding Powder D731-44T
Measuring the Flow Properties of Thermoplastic Molding Materials D569-44T
Power Factor and Dielectric Constant of Electrical Insulating Materials D150-44T
Rockwell Hardness of Plastics and Electrical Insulating Materials D785-44T
Short-Time Stability at Elevated Temperatures of Plastics Containing Chlorine D793-44T
Specific Gravity of Plastics D792-44T
Tensile Properties of Plastics D638-44T

Tentative Methods of Testing and Tolerances for:

Glass Yarn D578-44T

Tentative Specifications for:

Alternate Immersion Corrosion Test of Non-Ferrous Metals B192-44T
Conditioning and Classifying for Conditioning Plastics and Electrical Insulating Materials for Testing D618-44T
Flexural Test of Plastics D790-44T
Preparation of Metallographic Specimens E3-44T
Sampling and Testing Untreated Paper Used in Electrical Insulation D202-44T

American Society for Testing Materials (Continued)

Tentative Method of:

Aluminum-Base Alloy Die Castings B85-44T
Black Bias-Cut Varnished Cloth Tape Used for Electrical Insulation D373-44T
Cellulose Nitrate (Pyroxylin) Plastic Sheets, Rods and Tubes D701-44T
Flexible Treated Cotton and Rayon Sleeving Used in Electrical Insulation D372-44T
Hot-Rolled and Cold-Finished Corrosion-Resisting Steel Bars A276-44T
Laminated Thermosetting Materials D700-44T
Lap-Welded and Seamless Steel Pipe for High-Temperature Service A106-44T
Lightweight and Thin-Sectioned Gray Iron Castings A190-44T
Magnesium-Base Alloy Die Castings B94-44T
Malleable Iron Flanges, Pipe Fittings, and Valve Parts A277-44T
Melamine-Formaldehyde Molding Compounds D704-44T
Natural Rubber Cups for Use in Hydraulic Actuating Cylinders D818-45T
Orange Shellac and Other Indian Lacs for Electrical Insulation D784-44T
Pearlitic Malleable Iron Castings A220-44T
Phenolic Laminated Sheet for Radio Applications D467-44T
GR-S (Synthetic Rubber) Sheath Compound for Electrical Insulated Cords and Cables Where Extreme Abrasion Resistance Is Not Required D812-44T

Tentative Recommended Practice for:

Accelerated Weathering of Plastics Using S-1 Bulb and Fog Chamber D795-44T
Boiling Nitric Acid Test for Corrosion-Resisting Steels A262-44T
Determining Permanent Effect of Heat on Plastics D794-44T
Molding Specimens of Phenolic Materials D796-44T

Standard Methods of Testing:

Shellac Used for Electrical Insulation D411-44

Standard Methods of Testing and Tolerances for:

Certain Wool and Part Wool Fabrics D462-44
Worsted Yarns D404-44
Woven Glass Fabrics D579-44
Woven Tapes D259-44

U. S. Government

(Wherever a price is indicated, the publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C. In other cases, copies may be obtained from the government agency concerned.)

Army Air Forces

List of Material and Process Specifications Bulletin No. 23, March, 1945

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications are prepared for use by all government departments and establishments in their purchases. Copies are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. at 5 cents each. Requests should be accompanied by cash, check, or money order.

As a service to Company Members, the ASA maintains a sale file of all Federal Specifications. These specifications can be purchased from the ASA Sales Department.

Federal Specifications

Anvils; blacksmiths' (Amendment 1) GGG-A-576 April 15, 1945

Boxes; Wood, Nailed and Lock-Corner (Amendment 2) NN-B-621a April 14, 1945

Cabinet, Developing; X-Ray Film, Dental, (Complete with Developing-Tank and Accessories), (New) GG-C-55 April 15, 1945

Gelatin, plain; gelatin-dessert-powder; and starch-dessert-powder (superseding C-G-191a) C-G-191b March 15, 1945

Hardware, Builders'
hinges (nontemplate) (Amendment 1) FF-H-116b April 15, 1945
shelf and miscellaneous (Amendment 2) FF-H-111 March 15, 1945

Hay and straw; (for) bedding (superseding N-H-131) N-H-131a March 15, 1945

Knives; Drawing (superseding GGG-K-471) GGG-K-471a April 15, 1945

Oil; lubricating, car and locomotive-engine (new) VV-O-471 March 15, 1945

Paint
Concrete, and Masonry, Exterior, Eggshell-Finish, Ready-Mixed White and Tints (Amendment 3) TT-P-24 April 15, 1945
Graphite, Outside, Ready-Mixed, Black (Amendment 2) TT-P-27 April 15, 1945
Iron-Oxide, Ready-Mixed and Semi-Paste, Red and Brown (Amendment 2) TT-P-31a April 15, 1945
Oil, Exterior, Ready-Mixed, Light-Tints and White (Amendment 2) TT-P-40 April 15, 1945
Oil, Interior, One-Coat-Flat, Heavy-Bodied (For Thinning) Light Tints and White (Combined Sealer, Primer and Finish) (Amendment 1) TT-P-47 April 15, 1945
Oil, Interior, Eggshell-Flat-Finish, Ready-Mixed and Semipaste, Light-Tints and White (Amendment 2) TT-P-51a April 15, 1945
(For) Priming Plaster Surfaces (Plaster Primer and Sealer) TT-P-56 April 15, 1945 (Amendment 2)
Ready-Mixed, International-Orange (Amendment 2) TT-P-59 April 15, 1945

Paint (Continued)

Ready-Mixed, Olive-Drab (Amendment 1) TT-P-81a April 15, 1945

Phorometers (New) GG-P-311 April 15, 1945

Rules, Prince; Wood (With Leake Attachment) (New) GG-R-778 April 15, 1945

Squares; Carpenters', Die-Makers', and Machinists' (Superseding Amendment 1 and E-GGG-S-656) GGG-S-656 April 15, 1945

National Bureau of Standards (Washington 25, D. C.)

Commercial Standards

Commercial Electric-Refrigeration Condensing Units CS107-45 10¢

Grading of Diamond Powder CS123-45

Master Disks CS(E)124-45

Simplified Practice Recommendations

Abrasive Grain Sizes, Revision of R118-40 R118-45

Simplified Practice Recommendations (Continued)

Milk Shipping Cans R208-45

Treasury Department, Procurement Division (Washington 25, D. C.)

Federal Standard Stock Catalog, Section IV, Part 1, Federal Specifications Index, Revised to January 1, 1945 25¢

NBS Research Program Gives Data for Standard Fire Tests

A RESEARCH program carried out at the National Bureau of Standards recently to determine whether the product of temperature by time is a proper measure of exposure in fire tests has a definite application in the American Standard Fire Tests of Building Construction and Materials (ASTM C19-41; ASA A2.1-1942). In this standard, the permissible variation in the furnace temperature is defined in terms of variation of the area of the time-temperature curve above or below that of the standard curve.

In the standard fire resistance test of building constructions, the prescribed furnace temperatures are generally at higher levels than for fires that occur in actual buildings. It has been indicated, however, that substantially the same temperature rise is obtained on the unexposed side of a construction if the product of time by temperature, that is, the area under the fire exposure curve, is the same, the National Bureau of Standards announces.

To obtain further information on this point, the National Bureau of Standards subjected a refractory slab to carefully controlled exposures to uniform temperatures in the range 700 to 1300 F. The rise in temperature on the unexposed side was then noted. It was found that within this range a rise of 250 F on the unexposed side was obtained for very nearly the same time-temperature area, the variations being within experimental error.

It was also indicated by the results (as also from theoretical considerations) that, assuming no change in the thermal properties of the construction, the ratio of temperature rise on the unexposed surface to hot-side temperature is a function of time only and does not depend on temperature, the Bureau declares. Hence it was possible by mathematical methods to apply the results obtained at constant hot-side temperatures to the solution for conditions where these vary with time as they do in furnace tests and in exposures of constructions to fires in buildings, according to the Bureau's announcement.

NBS Acts on Standards and Recommendations

Commercial Standards

Announced by the Division of Trade Practice, National Bureau of Standards

The effective date for new production of diamond powder in accordance with Grading of Diamond Powder, Commercial Standard CS123-45, has been extended from April 5 to May 5, 1945.

Prefabricated Homes, CS 125-45—

A Commercial Standard intended to establish a measure of quality for prefabricated homes has been accepted by a satisfactory majority of manufacturers, distributors, and users the Division of Trade Standards announces. The standard provides minimum requirements for 1, 1½ and 2-story prefabricated homes. It covers structural strength of the various component parts, requirements for light and ventilation, and recommended requirements for foundations, chimneys, heating, plumbing, insulation, and electrical wiring. It also includes general requirements for material, workmanship as provided by the manufacturers, erection at site, and assembly of prefabricated units, and protection during transportation and erection. The standard is effective for new production from May 10, 1945. Mimeographed copies are now available from the Division of Trade Standards, National Bureau of Standards, Washington 25, D. C.

Apparel Sizes, Infants to Children, Proposed Commercial Standard TS-3902—

A proposed Commercial Standard to establish a system of body measurements as a basis for the sizing of children's clothing has been distributed for consideration of the groups concerned. The proposed standard was submitted to the Division of Trade Standards by the Mail Order Association of America. It covers classifications, size designations, and scales of body measurements for infants, babies, toddlers, and children, including the "regular" sizes for boys and girls up to a stature of 48 inches and a weight of 52 pounds. It also includes definitions and methods of measuring vertical and girth body measurements, as well as garment lengths. The sizes proposed are based on the research carried out by the U. S. Bureau of Home Economics and used by the ASA Sectional Committee on Body Sizes, L11, in preparing the American Standard Body Sizes for Boys' Garments, L11.1-1941. The proposed standard is the first of a coordinated series, covering all classifications of juvenile apparel up to teen age girls and boys and is so arranged that there will be no gaps or conflicts in body measurements between the different classifications. The proposed standard is known as Proposed Commercial Standard on Body Measurement Scales for Apparel Sizes for Infants, Babies, Toddlers, and Children, TS-3902. Further information concerning it can be obtained from the Division of Trade Standards, National Bureau of Standards, Washington 25, D. C.

Proposed Simplified Practice Recommendations

Announced by the Division of Simplified Practice, National Bureau of Standards

Files and Rasps, R6—

A proposed revision of Simplified Practice Recommendation R6-44, Files and Rasps (American Pattern, and Straight- and

Curved-Tooth Milled Files) has been mailed to all interests for consideration and acceptance, the Division of Simplified Practice, National Bureau of Standards, announces.

The last revision of this recommendation became effective October 6, 1944, when the War Production Board revoked the mandatory simplification order under which the industry had been operating. The order was used as the preliminary step in establishing R6-44, and new revision is now proposed to complete the transition to post-war needs. It restores the original widths and thicknesses of certain types and sizes, and adds several sizes of flat brass files and hand-saw blunt files as well as second-cut in five sizes of mill files. One size in each of six other types is eliminated.

A limited number of mimeographed copies of the proposed revision is available from the Division of Simplified Practice, National Bureau of Standards, Washington 25, D. C.

Peanut Butter Containers—

A proposed new Simplified Practice Recommendation has been submitted to the peanut butter manufacturers, glass container manufacturers, and others interested for acceptance or comment. "This proposed package simplification program represents an effort on the part of the industry, through voluntary action, to eliminate avoidable waste, conserve materials, and improve marketing practices," the announcement explains. The proposal lists the ½ lb, 1 lb, 1½ lb, and 2 lb sizes as the standard stock sizes for retail packages in jars, and the 8 oz, 10 oz, 12 oz, and 14 oz as the stock sizes for retail packages in tumblers.

Overflow capacities, maximum weight of glass, dimensions, and finishes are specified for the jars, and overflow capacities and finishes are prescribed for the tumblers.

Screw-Thread Standards For Federal Services, 1944

THE National Bureau of Standards' new Handbook H28 (1944) *Screw-Thread Standards for Federal Services*, has now been published, superseding the edition of 1942. The revision was prepared by the Interdepartmental Screw Thread Committee (ISTC) whose membership consists of representatives of the War, Navy, and Commerce Departments. Close cooperation between this committee and technical committees on screw threads of the American Standards Association is made possible by the fact that the American Standards Association has four liaison representatives on the ISTC:

E. J. Bryant, Greenfield Tap & Die Corporation; ASA War Committee B1

J. H. Edmonds, Bethlehem Steel Company; ASA Sectional Committee B1

A. M. Houser, U. S. Combined Production and Resources Board, Washington, D. C.; Liaison Member, ASA War Committee B1; ASA Sectional Committees B1 and B2

Charles C. Winter, Union Twist Drill Company; ASA Sectional Committees B1 and B2

The new edition, like that of 1942, contains data on the several kinds of threads covered by American Standards such as those for coarse and fine threads, pipe threads, and threads for hose couplings and fire-hose couplings, and rolled threads for screw shells of electric sockets and lamp bases. The Handbook also contains two American War Standards approved by the ASA since the 1942 edition was published. One is American War Standard Screw Threads of Truncated Whitworth Form, B1.6-1944, which has been added as Appendix 4. The other is the American War Standard for Acme Threads, B1.5-1944, just published by the ASA (see page 93).

In commenting on the new issue of Handbook H28, the National Bureau of Standards calls attention to the fact that the manufacture of screw threads and thread gages for Army ordnance will continue to be governed by component and gage drawings issued by the Army Service Forces which were based on a previous edition, Handbook H25 (1939).

Handbook H28 (1944) may be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 60 cents a copy.

NBS Research to Offer Test for Plasters

The development of a satisfactory test for determining soundness of plasters or mortar, which has been the subject of research for several years, has been of particular interest to those groups connected with the writing of specifications. Governmental agencies, the American Society for Testing Materials, and the ASA Sectional Committee on Plastering, A42, have been among the groups especially concerned. A research study recently undertaken by the National Bureau of Standards now promises to be helpful in bringing about a solution to this long-standing problem.

The investigation has been undertaken to develop an accelerated autoclave test which will differentiate those hydrated limes that are likely to expand and form bulges in the finish surface from those that will give little or no expansion. The procedure for such a performance test has now been formulated.

A few years ago, the Bureau carried out an investigation of this type of plaster failure, characterized by the formation of bulges in the finish surface. As a result, manufacturers of lime started to convert their hydrating plants to produce a finishing and masonry lime in which the magnesia was more nearly completely hydrated. The war, with its demand for steel and other critical materials, has delayed this conversion, however. As a result, there is still a need for the performance test now being developed at the National Bureau of Standards to differentiate hydrated limes that can cause a marked expansion from those giving little or no expansion.

Dictionary of Foreign Welding Terms

A glossary of foreign welding terms, published by the American Welding Society, is now available as a supplement to standard or engineering dictionaries. The glossary was compiled by M. A. Cordovi, Research Assistant, Welding Research Council of the Engineering Foundation.

Designed to define and thus standardize welding terms, the glossary covers English definitions or equivalents for German, French, Russian and Spanish terms, many of which are derived from foreign technical literature and are not found in any standard or technical dictionaries.

The glossary is published as a paper-covered pamphlet of 16 pages. Copies are available from the American Welding Society, 33 West 39 Street, New York 18, N. Y., at 50 cents.

ASA Standards Activities

American Standards

American Standards Available Since Our April Issue

For new American Standards available during the past month, see page 111. As a membership service, the American Standards Association offers its Members one copy of each newly approved American Standard and American War Standard for the first $50 of annual membership, and an additional copy for each $100 beyond this. Only one person in each company is authorized to return the list requesting these copies. If you would like to have any of these new standards, we suggest you get in touch with your company's authorized representative. When your company's quota is filled, additional copies can be ordered at 20 percent discount to Members.

ASA Approval Withdrawn

Electric Arc Welding Apparatus, C52.1-1933

Resistance Welding Apparatus, C52.2-1933

Standards Being Considered by ASA for Approval

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1

Building Code Requirements for Reinforced Gypsum Concrete, Revision of A59.1-1941

Sponsors: Building Officials Conference of America; Gypsum Association

Circuit Breakers

Alternating-Current Power Circuit Breakers, C37.4

Method for Determining the Rms Value of a Sinusoidal Current Wave and a Normal-Frequency Recovery Voltage, C37.5

Schedule of Preferred Ratings for Power Circuit Breakers, C37.6

Operating Duty (Duty Cycle) for Standard and Reclosing Service, C37.7

Rated Control Voltages, C37.8

Test Code for Power Circuit Breakers, C37.9

Sponsor: Electrical Standards Committee

Gas-Burning Appliances—

Gum Protective Devices, Listing Requirements, Z21.35

Sponsor: American Gas Association

Pipe and Tubing, Wrought-Iron and Wrought-Steel—

Electric-Resistance-Welded Steel Boiler and Superheater Tubes for High-Pressure Service, Specifications for (Revision of ASTM A 226-40; ASA B36.18-1942)

Electric-Resistance-Welded Steel and Open-Hearth Iron Boiler Tubes, Specifications for (Revision of ASTM A 178-40; ASA B36.13-1942)

Electric-Resistance-Welded Steel Pipe, Specifications for (Revision of ASTM A 135-42; ASA B36.5-1942)

Lap-Welded and Seamless Steel and Lap-Welded Iron Boiler Tubes, Specifications for (Revision of ASTM A 832-42; ASA B36.12-1942)

Medium-Carbon Seamless Steel Boiler and Superheater Tubes, Specifications for (Revision of ASTM A 210-40; ASA B36.15-1942)

Seamless Alloy-Steel Boiler and Superheater Tubes, Specifications for (Revision of ASTM A 213-42; ASA B36.17-1942)

Seamless Steel Boiler Tubes for High-Pressure Service, Specifications for (Revision of ASTM A 192-40; ASA B36.14-1942)

Spiral-Welded Steel or Iron Pipe, Specifications for (Revision of ASTM A 211-40; ASA B36.16-1942)

Welded and Seamless Steel Pipe, Specifications for (Revisions of ASTM A 53-42; ASA B36.1-1942)

Sponsors: American Society for Testing Materials; American Society of Mechanical Engineers.

Photography—

Bite of Film Clips, Proposed American Standard Dimensions, Z38.8.4

Sponsor: Optical Society of America

New Project Requested

Safety in Electric and Gas Welding and Cutting

American War Standards

American War Standards Available Since Our April Issue

For new American War Standards available during the past month, see page 111.

American War Standards Approved Since Our April Issue

Controls for Resistance Welding Machines, C52.4-1945

Specification for Resistance Welding Machines, C52.5-1945

Straight and Offset Resistance Welding Electrodes and Electrode Holders, C52.3-1945

War Standards Under Way

Cylindrical Fits, B4.1

Drawings and Drafting Room Practice, Z14

Linemen's Rubber Protective Equipment, J6

- Leather Protector Gloves, J6.3
- Linemen's Rubber Sleeves, Voltage Rating 3,000 Volts, J6.5
- Rubber Insulating Blankets for Use Around Electrical Apparatus or Circuits not exceeding 3,000 Volts to Ground, J6.4

Machine Tool Electrical Standards (Revision of C74-1942)

Photography and Cinematography, Z52

Motion Picture Cameras

- Distance Calibration of 16-Mm Motion Picture Camera Lenses, Z52.51
- Field of View of 16-Mm Motion Picture Camera View Finders Having Parallax Adjustment, Z52.49
- Mounting Dimensions for 16-Mm Camera and Recorder Film Magazines (400-Foot Gear-Driven Type), Z52.52
- Mounting Dimensions for 16-Mm Camera and Recorder Magazines (200-Foot Belt-Driven Type), Z52.66
- Mounting Dimensions for 16-Mm Camera and Recorder Magazines, (400-Foot Belt-Driven Type), Z52.67
- Photographing Aperture of 16-Mm Sound Motion Picture Cameras, Z52.47
- Photographing Aperture of 16-Mm Silent Motion Picture Cameras, Z52.48
- Registration Distance and Mounting Dimensions of 16-Mm Motion Picture Camera Lenses, Z52.50

Motion Picture Projection Equipment

- Class II Service Model 16-Mm Sound Motion Picture Projection Equipment, Specification for, Z52.13
- Projection Screens (Semi-Diffusing Reflecting Surface), Brightness Characteristics, Z52.46
- Projection Screens (Mounted on Spring Rollers), Specification for, Z52.56
- Projection Screens (Mounted on Rope-and Pulley-Operated Springless Rollers), Z52.57

Motion Picture Projection Equipment (Continued)

Projection Screens (Folding, for Portable-Frame Mounting), Z52.58

Projection Screens (Auditorium-Frame Mounting), Z52.59

Reel Spindles for 16-Mm Motion Picture Projectors, Z52.34

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Leaders, Cues, and Trailers for 16-Mm Sound Motion Picture Release Prints Processed from Original 16-Mm Material, Z52.31

Picture and Sound Synchronization Marks for 35-Mm and 16-Mm Sound Motion Picture Release Negatives and Other Preprint Material, Z52.53

Printer Loss in 16-Mm Sound Motion Picture Prints, Method of Determining, Z52.40

Motion Picture Test Films

Warble Test Film Used for Testing 16-Mm Sound Motion Picture Equipment, Specification for, Z52.32

Photographic Filter Terminology and Nomenclature, Z52.61

Still Cameras

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Exposure Markings for Focal Plane Shutters, Z52.64

Exposure Time of Focal Plane Shutters, Method of Determining, Z52.65

Performance Characteristics of Between-the-Lens Shutters, Method of Determining, Z52.63

Still Printing Equipment

Contact Printer, Photographic, Specification for, Z52.18

Still Printing Equipment (Continued)

Enlarger, Photographic, Specification for, Z52.23

Still Projection Equipment

Projectors for Slides and Slide Film, Specification for, Z52.28

Protective Occupational (Safety) Clothing, L18

Gloves to Provide Protection Against Chemicals

Radio, Noise, Methods of Measuring, C63

Safety Color Code for Marking Physical Hazards, Z53

Safety Color Code for the Industrial Use of X-Rays, Z54

Screw Threads, B1

High-Duty Studs in Light Alloys

Instrument Threads

Stub Acme Threads

Unification of Screw Threads

News About ASA Projects

Building Code Requirements for Minimum Design Loads in Buildings and Other Structures, A58.1—

Sponsor: National Bureau of Standards.

The proposed standard as approved by the sectional committee and the sponsor is now out to letter ballot of the ASA Building Code Correlating Committee.

Building Code Requirements for Reinforced Gypsum Concrete, A59

Sponsors: Gypsum Association; Building Officials Conference of America.

ASA Sectional Committee A59 has completed a study of the American Standard on Building Code Requirements for Reinforced Gypsum Concrete, A59.1-1941, in accordance with ASA By-Law requirements that approved standards be reviewed every three years, the Gypsum Association, joint sponsor with the Building Officials Conference of America, has reported. As a result of the study, a revision of the standard to incorporate minor editorial changes has been approved by the Building Code Correlating Committee and submitted to the Standards Council.

Circuit Breakers, C37—

Sponsor: Electrical Standards Committee

Six proposed American Standards on Circuit Breakers are now being considered by the Electrical Standards Committee for recommendation to the Standards Council. These proposed standards have been under development since 1932. In 1941 they were published for a period of trial, and the new drafts now being considered include changes made as the result of experience gained during this trial period. The proposed standards are:

Alternating-Current Power Circuit Breakers, C37.4

Method for Determining the Rms Value of a Sinusoidal Current Wave and a Normal Frequency Recovery Voltage, C37.5

Schedule of Preferred Ratings for Power Circuit Breakers, C37.6

Operating Duty (Duty Cycle) for Standard and Reclosing Service, C37.7

Rating Control Voltages, C37.8

Test Code for Power Circuit Breakers, C37.9

Coordination of Dimensions of Building Materials and Equipment, A62—

Sponsors: Building Officials Conference of America; National Fire Protection Association.

The Proposed American Standard for the Coordination of Dimensions of Building Materials and Equipment, A62.1, and the Proposed American Standard Basis for the Coordination of Masonry, A62.2, both of which were revised February 1, were sent to letter ballot of the ASA Sectional Committee April 10.

In a letter to the members of the committee, M. W. Adams, secretary, stated that several producing industries are developing proposed standard coordinated sizes for their products and plan to submit these for ASA approval later. Mr. Adams also reported that manufacturers of some products have distributed announcements of the proposed new sizes which, if adopted, are to be manufactured as soon as new equipment can be obtained. Architects are readying plans for a large volume of post-war building, he added.

Protective Occupational (Safety) Clothing, L18—

The Subcommittee on Leather, Asbestos, Woolen, and Flame-Resistant Clothing which has been active since February 10, 1944, in the preparation of the American War Standards L18.1-1944 through L18.6-1944, L18.14-1944 through L18.17-1944, and L18.21-1945 through L18.28-1945, has completed its work and has been discharged by the chairman of the ASA War Committee. This subcommittee was the first of the subcommittees working on protective occupational clothing to complete the work assigned. Following the completion of its work, E. L. Wheeler, chairman of the subcommittee, wrote the subcommittee members: "With your efficient, stimulating, cheerful, and constructive help, Ours has become the first subcommittee of Committee L18 to complete its work. Congratulations! . . . I am sure we all received something of real value from our work and, furthermore, have made a concrete contribution to the war effort as well as one of lasting benefit to the safety movement in general."

Safety Code for the Industrial Use of X-Rays, Z54—

The War Committee on this subject has approved Part 1 of a proposed American War Standard Safety Code and the proposed standard has been sent to letter ballot of the Safety Code Correlating Committee.

Safety Color Code for Marking Physical Hazards, Z53—

The ASA War Committee on the Safety Color Code held a meeting April 24 and voted to send the proposed standard to letter ballot for approval. The standard specifies the colors to be used in identifying specific hazardous locations in industrial plants. It has been left to a subcommittee to define the colors used in the standard within clearly recognized limits, taking into consideration those colors that are most readily distinguished by a majority of persons who are color-blind. It is expected that the color definitions will be published as an appendix to the standard.

Safety in Electric and Gas Welding and Cutting—

The American Welding Society has asked the American Standards Association to organize a project for the development of an American Standard on Safety in Electric and Gas Welding and Cutting to carry over into peacetime the provisions of the American War Standard, Z49.1-1945. Following publication of the American War Standard, the Society declares, there was a general feeling that a real need for the establishment of safe practices for welding had been met. There was also some comment to the effect that the standard needed modifying on one or two points, and also that the provisions of the standard should be perpetuated beyond the normal period of American War Standards. As a result, the Board of Directors of the American Welding Society voted to recommend that the ASA organize a project on safety in welding. The Society offered to serve as sponsor for this project.

NEW MECHANICAL, SAFETY, PHOTOGRAPHIC STANDARDS RECENTLY PUBLISHED

MECHANICAL engineers in many industries will be interested in the new American War Standard for Acme Threads and the new American Standard for Spring Lock Washers (Carbon Steel), listed among the new standards available from the American Standards Association this month. • • • Safety engineers, as well as factory managers in industries where intense heat is a hazard, will find the new American War Standards for flame-resistant fabric clothing of special interest. • • • A long list of new standards on photography and cinematography, the latest in a comprehensive series which eventually will include all phases of still photography and motion pictures in which standards will be helpful will assist both manufacturers and users of photographic supplies and equipment in securing more satisfactory photographic results. Nearly 150 American Standards and American War Standards providing specifications, dimensions, and methods of test have already been published in this series, and many others are on the way.

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.....	Z52.29-1945	**35-mm Slide Film** for Use in Still Picture Projectors, Specifications for (American War Standard)	.10
.....	Z52.41-1945	**Sizes of Projection Screens** (American War Standard)	.10
.....	Z52.44-1945	**Sound Transmission** of Perforated Projection Screens (American War Standard)	.10
.....	Z52.45-1945	**Whiteness of Projection Screens** (Semi-Diffusing Reflecting Surface) (American War Standard)	.10
.....	Z52.55-1945	**Method of Determining Resolving Power** of Slide Film Projector Lenses (American War Standard)	.10
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